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Anna K. Johnson
Iowa State University, johnsona@iastate.edu

Emma C. Farruggio
Iowa State University, emmaf@iastate.edu

Samantha J. Hamlin
Iowa State University, sjhamlin@iastate.edu

Theresa P. Johnson
Iowa State University, tpj87@iastate.edu

Marshall V. Ruble
Iowa State University, mruble@iastate.edu

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Effects of Calf Birth Weight, Sex, and Number of Calvings on Assigned Maternal Disposition Scores

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Anna Johnson, Associate Professor;
Emma Farruggio, Undergraduate Assistant;
Samantha Hamlin, Undergraduate Assistant;
Theresa Johnson, Research Associate II;
Marshall Ruble, Supt Ag Res Station I,
Department of Animal Science, Iowa State University

Summary and Implications

Little work has been conducted to compare maternal disposition scores assigned to a heifer/cow after calving, and if these scores remain stable over consecutive calvings. The objective of this trial was to determine if calf birth weight, sex, and the number of calvings affects the cows maternal disposition scores. The fall data set included observations from 406 calvings, which were pure Angus (n = 316), pure Simmental (n = 75), or crosses of the two breeds (n = 43). The spring data set included observations from 550 calvings, which were Angus (n = 253) or Simmental (n = 338). All calvings occurred on pasture. The data set included date and time of birth, birth weight (kg), sex of the calf, and a maternal disposition score. The maternal disposition score was based on the cow's reaction to both the calf and human interaction. The scale used to score cows ranged from one through five and was created at the ISU beef farm. Data was analyzed using PROC GLIMMIX. There were no observed differences for disposition score in either season when cows birthed heavier calves ($P > 0.86$), if the cow had a bull versus a heifer ($P > 0.50$) or the number of calvings that they experienced ($P > 0.76$). In conclusion, using this particular maternal disposition scoring, no observed changes in disposition score occurred with calf birth weight, calf sex or the number of calvings.

Introduction

The cow-calf relationship at calving is critically important for calf survival. Positive maternal behaviors include licking the calf immediately after birth, allowing the calf to suckle and protection. Assigning cows a disposition score during and/or after calving is one tool that can be used to measure their handling ability, acceptance of the calf, and attitude towards the producer. One scoring system has been developed by the Beef Improvement Federation and involves a six point scale ranging from (1) docile to (6) very aggressive. Another disposition scoring system developed in the early 1990s rates the actual activity of the cow, and has a five point scale ranging from (1) calm, no movement to (5) rearing, twisting of the body. Little work has been conducted to compare maternal disposition scores assigned to a heifer/cow after calving, and if these scores remain stable over consecutive calvings. Furthermore, the effect of calf variables such as size at birth or calf sex on the disposition score given to a cow remains unclear. Therefore, the objective of this trial was to determine if calf birth weight, sex, and the number of calvings affects the cow's maternal disposition scores.

Materials and Methods

Experimental design and treatments: The experimental unit was the cow and her calf. Data was collected by one producer using live observation within 8-h of calving. Cow-calves were housed at the Iowa State University (ISU) Beef Farm in both the fall and spring, between 2005 and 2012. This data was collected as part of the daily observations required at the beef farm and no specific IACUC was required. The fall data set included observations from 406 calvings, which were pure Angus (n = 316), pure Simmental (n = 75), or crosses of the two breeds (n = 43). The spring data set included observations from 550 calvings, which were Angus (n = 253) or Simmental (n = 338). All calvings occurred on pasture.

Maternal disposition score: The score was based on the cow's reaction to both the calf and human. The scale used to score cows ranged from one through five and was created at the ISU beef farm (Table 1).

Table 1. Maternal cow disposition scoring guidelines.

Score	Description	Defined
1	Abandonment	Cow remains ≥ 10 m from calf
2	Tolerates	When calf approaches cow she moves away, walks in circles but does allow some limited calf contact
3	Normal	Cow remains ≤ 1m from calf and allows uninhibited access to udder and is protective
4	Aggressive	Cow steps forward with head lowered, paws ground, and/or vocalizes toward calf and/or handler
5	Extremely aggressive	Cow charges at calf and/or handler

Measures taken: The data set included date and time of birth, birth weight (kg), sex of the calf (heifer or bull), and a maternal disposition score (scale 1 through 5; Table 1).

Statistical Analysis

The disposition scores were converted from the five point scale to either a (1) normal cow behavior (which would have been a 3 Table 1) or (2) abnormal cow behavior (categories 1, 2, 4 & 5). This two categorical scoring system was created per guidance from a statistician because there were so few 1, 2, 4 and 5 scores. Data was analyzed using PROC GLIMMIX for the effects of calf birth weight, calf sex, and number of calvings on maternal disposition score. A P value of ≤ 0.05 was used to determine significance.

Results and Discussion

There were no observed differences for disposition score in either season when cows birthed heavier calves ($P > 0.86$; Figures 1a and b), if the cow had a bull versus heifer ($P > 0.50$; Figures 2a and b) or the number of calvings that they experienced ($P > 0.76$; Figures 3a and b). In conclusion using this particular maternal disposition scoring, no observed changes occurred with calf birth weight, calf sex or the number of calving's. Maternal scoring for cows at the ISU farm were one, indicating a normal cow-calf-human relationship.

Figure 1. Calf birth weight and disposition score in Fall (a) and Spring (b) $P > 0.86$

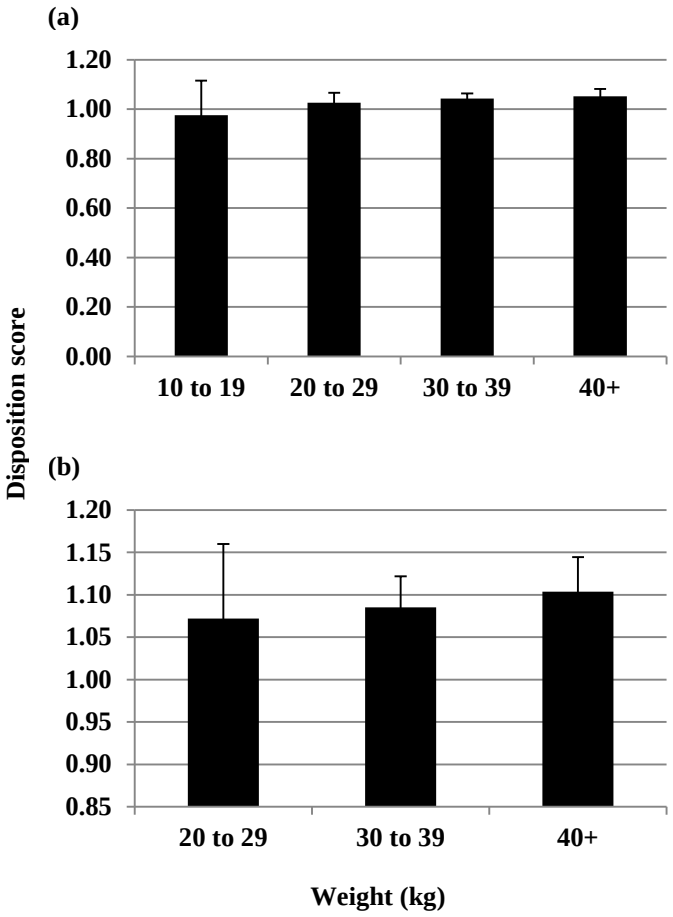


Figure 2. Calf sex and disposition score in Fall (a) and Spring (b) $P > 0.50$

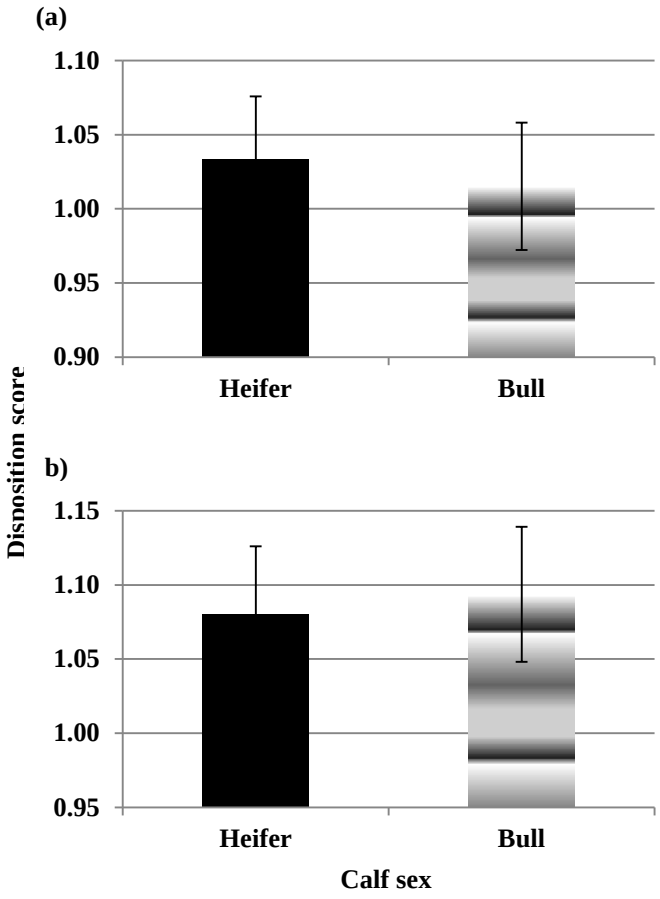
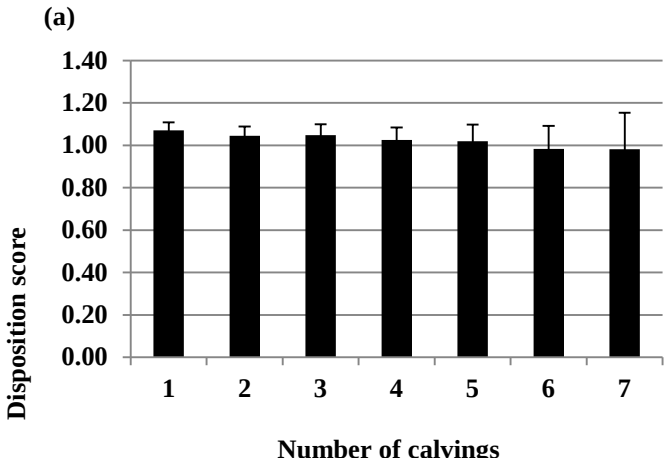
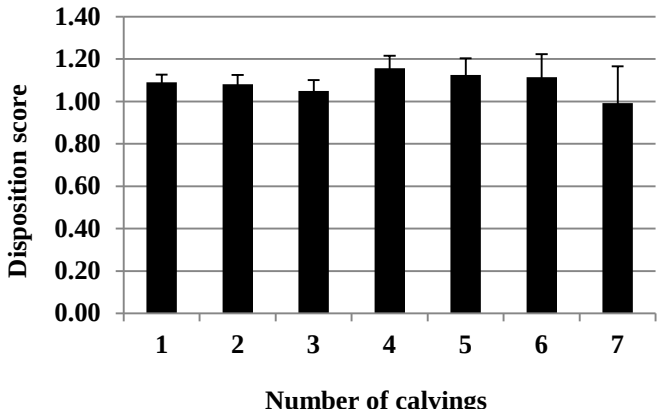


Figure 3. Number of calvings and disposition score in Fall (a) and Spring (b) $P > 0.76$



(b)


1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Disposition score
1
2
3
4
5
6
7
Number of calvings